

ever, the contour of the superior costa is broken by a deep round notch immediately behind the coracoid: in the Hippopotamus this process arches in a slight degree backward over a corresponding but wider and shallower notch. In the *Palæotherium crassum* the concavity of the superior costa, behind the coracoid, is as slight as in the Rhinoceros; but in the *Macrauchenia* the superior costa of the scapula begins to rise or stretch away from the parallel of the spine, immediately behind the coracoid process. The modifications of the spine of the scapula which characterize respectively the Ruminants and Pachyderms have been clearly and concisely set forth by Cuvier, who at the same time points out the exceptional condition which the *Camelidae* present in the production of the acromial angle. It was with peculiar interest and care, therefore, that I reunited all the fragments of the scapula of the *Macrauchene*, in the hope of gaining from this part of the skeleton as decisive evidence of an affinity to the Camel as the cervical vertebræ had afforded. It unfortunately happens, however, that the part of the scapula most important in this comparison is broken off; yet from this very circumstance, combined with a slight inclination forwards of the anterior margin of the spine immediately beneath the fractured acromion, and from the thickness of the fractured surface, we may infer that the acromial angle of the spine was more produced than in the ordinary Ruminants, although evidently in a less degree than in the Camel tribe. The *Macrauchenia*, however, surpasses these aberrant Ruminants, and equals the Pachyderms in the elevation and extent of its scapular spine: but this process commences about half an inch behind the glenoid cavity, and rises at once to the height of three inches above the plane of the scapula; in which structure we may trace the same tendency to the Ruminant type, as is manifested in the scapula of the Hippopotamus and Anoplotherium; for in most other Pachyderms the spine increases gradually from its extremities to the middle part. The anterior margin of the spine beneath the short acromion is perforated by an elliptical fissure measuring ten lines, by three lines. The extent of the spine which is preserved, measures eight inches and a half; it is a thin and nearly straight plate of bone, expanding into a thick and rugged upper margin, which slightly over-arches the inferior fossa. (fig. 1, Pl. IX.) In its general form and proportions the spine of the scapula in *Macrauchenia* presents the nearest resemblance to that of the Hippopotamus; but its origin is closer to the articular surface of the scapula than in this, or any other Pachydermal or Ruminant genus.

The portion of the antibrachium of the *Macrauchenia* which is preserved, presents a condition of the radius and ulna intermediate to those which respectively characterize the same bones in the Pachyderms and Camels. In the former the radius and ulna are separate bones, united in the prone position by ligament, yet so that the movement of supination cannot be performed; in the

ordinary Ruminants they are partially joined by bony confluence, which rarely extends to the proximal extremities; in the Camel and Llama the ankylosis of the radius and ulna is so complete, that no trace of their original separation can be perceived, and the olecranon appears but as a mere process of the radius.

In the *Macrauchenia* the ankylosis of the radius and ulna is also complete, but the boundary line of the two originally distinct bones is very manifest, and the proportion which each contributes to the great articulating surface for the distal end of the humerus is readily distinguishable. About a sixth part of this surface is due to the head of the radius, which enters into the composition of the anterior and outer part of the articulation, and its extent is defined by a depressed line describing a pretty regular curve, with the concavity directed forwards and a little outwards. (a, fig. 1, Pl. X.) Just below the articular surface a strong triangular rugged protuberance projects from the front of the head of the radius, for the attachment of the tendon of the biceps. The line of separation of the radius and ulna is indicated on the inner side of the head of the radius by a deep and narrow fissure extending downwards from below the anterior part of the articulating surface; and on the outer side by a broad groove leading upwards to a deep pit near the proximal end of the antibrachium. We may see by the direction of the head of the radius which is thus defined, that it crosses obliquely in front of the ulna, as in the Elephant, Hippopotamus, and other Pachyderms, and that the bones are ankylosed in the prone condition: below this fissure and groove, which mark the interosseous line, the radius and ulna become blended together into one compact bone, which is flattened from before backwards, with a well marked ridge on the outer side; and excavated by a single medullary cavity, the compact walls of which present a general thickness of one-third of an inch.

The proximal articular surface or sigmoid cavity of the antibrachium, constituted as above described, resembles that of the *Palæothere*, *Tapir*, and the generality of the Pachyderms in having two depressions, instead of three, as in the *Anoplothere*, and Ruminants. The Hippopotamus has a slight tendency to the latter structure, which is also less marked in the Camel than in the ordinary Ruminants. In its general form the sigmoid cavity of the *Macrauchene* resembles that of the Hippopotamus more than that of the Camel. In the Camel this articular surface is traversed transversely by a broad, shallow, and slightly roughened tract, which divides the smooth surface of the joint into two parts, one forming the anterior horizontal surface due to the conjoined radius and ulna, the other forming the vertical concave surface on the anterior part of the base of the olecranon. In the Hippopotamus there is, as it were, an attempt at a similar division of the articulating surface at the proximal end of the antibrachial bones; a deeper and rougher depression encroaches upon the articulation from its outer side, but stops when it has reached half-way across. In the